

REMARKS

The Applicants appreciate the thorough examination of the present application as evidenced by the Office Actions of May 17, 2004, October 25, 2004, and January 10, 2005. In particular, the Applicants appreciate the indication that Claims 2-6, 11-12, 15, 22, and 48 would be allowable if rewritten in independent form and that Claims 23-26, 43, 44, and 47 are allowed. The Applicants also appreciate the withdrawal of all previous rejections based on U.S. Patent No. 4,496,416, U.S. Patent No. 6,544,376, and U.S. Publication No. 2002/0172969.

In response, the Applicants have canceled Claim 1; rewritten Claim 2, 10, 11, 12, 14, 15, 16, and 24 in independent form; amended Claim 7 to depend from Claim 10; amended Claims 8, 9, 13, 17, 18, and 45 to depend from Claim 2; and added new Claims 49-51. The Applicants will also show in the following remarks that Claims 10, 14, 16, and 19 are patentable over the cited art. Accordingly, the Applicants respectfully submit that all pending claims are in condition for allowance. A Notice of Allowance is thus respectfully requested in due course.

Claims 10 And 19 Are Patentable Over Kaneyama

Claims 10 and 19 have been rejected under 35 U.S.C. Sec. 102(e) as being anticipated by U.S. Patent No. 6,761,302 to Kaneyama ("Kaneyama"). Claim 19, however, is patentable over Kaneyama for at least the reasons discussed below.

Claim 19 recites a method of positioning a component on a substrate, the method including:

- providing an initial volume of liquid on a wettable area of the substrate adjacent the component such that the component has a first position relative to the substrate;
- changing the volume of the liquid on the wettable area of the substrate adjacent the component by providing additional liquid on the wettable area of the substrate adjacent the component to move the component from the first position relative to the substrate to the second position relative to the substrate while maintaining the liquid in a liquid state; and
- after providing the initial volume of the liquid and changing the volume of the liquid, securing the component in the second position relative to the substrate.

(Underline added.)

In support of the rejection, the Office Action states that: "The volume ... of the solder would change on heating (col 5 lines 5-7)." However, Claim 19 recites changing a volume of a

liquid on a wettable area by providing additional liquid on the wettable area. Kaneyama fails to teach or suggest changing a volume of a liquid on a wettable area of a substrate in this manner.

Accordingly, the Applicants respectfully submit that Claim 19 is patentable over Kaneyama. The Applicants further submit that Claim 10 is patentable over Kaneyama for reasons similar to those discussed above with respect to Claim 19. In addition, Dependent Claims 20-22, 46, and 49 are patentable at least as per the patentability of Claim 19 from which they depend.

Claim 16 Is Patentable Over Kaneyama

Claim 16 has been rejected under 35 U.S.C. Sec. 102(e) as being anticipated by U.S. Patent No. 6,761,302 to Kaneyama ("Kaneyama"). Claim 16, however, is patentable over Kaneyama for at least the reasons discussed below.

As rewritten in independent form, Claim 16 recites a method of positioning a component on a substrate, the method including:

providing a liquid material on the substrate adjacent the component such that the component has a first position relative to the substrate; and
changing a property of the liquid material while in a liquid state to move the component from the first position relative to the substrate to a second position relative to the substrate while the liquid material is maintained in a liquid state;
wherein the liquid material is constrained on a wettable area of the substrate wherein the wettable area includes a first portion having a first dimension and a second portion having a second dimension, wherein changing the property of the liquid material comprises changing a temperature of the liquid material.

Kaneyama fails to teach or suggest that a liquid material is constrained on a wettable area of a substrate wherein the wettable area includes a first portion having a first dimension and a second portion having a second dimension. In particular, Kaneyama states that:

the circular substrate electrodes 6 formed on the substrate 5 and the circular optical device electrodes 14 formed on the optical device 13 are joined to each other through the solder bumps 12. (Underline added.)

Kaneyama, col. 4, lines 32-36. The "circular" electrodes of Kaneyama thus fail to teach or suggest a wettable area including different portions with different dimensions.

Accordingly, the Applicants respectfully submit that Claim 16 is patentable over Kaneyama. The Applicants further submit that dependent Claims 50 and 51 are patentable at least as per the patentability of Claim 16 from which they depend.

Claim 14 Is Patentable over Kaneyama and Powell

Claim 14 has been rejected under 35 U.S.C. Sec. 102(e) as being anticipated by Kaneyama. Claim 14 has also been rejected under 35 U.S.C. Sec. 102(b) as being anticipated by the reference by Powell et al. entitled "Mechanism Of Motion Of An Optical Fiber Aligned By A Solder Droplet" ("Powell"). The Applicant respectfully submits, however, that Claim 14 is patentable over Kaneyama and Powell for at least the reasons discussed below.

As amended, Claim 14 recites a method of positioning a component on a substrate, the method including:

providing a liquid material on the substrate adjacent the component such that the component has a first position relative to the substrate; and

changing a property of the liquid material while in a liquid state to move the component from the first position relative to the substrate to a second position relative to the substrate while the liquid material is maintained in a liquid state wherein changing the property of the liquid material comprises changing a fluid in contact with the liquid material while the liquid material is maintained in a liquid state.

Neither Kaneyama or Powell teaches or suggests changing a fluid in contact with a liquid material while the liquid material is maintained in a liquid state. As discussed in Kaneyama:

The substrate 5 against which the solder pieces 4 are bumped is disposed at the bottom portion of the container 7 in which the inactive liquid 9 is filled. The substrate 5 is heated by the heater 8 to melt the solder pieces 4.

Kaneyama, col. 4, lines 45-49. Nothing in Kaneyama, however, teaches or suggests changing a fluid in contact with the solder pieces 4 while the solder pieces 4 are maintained in a liquid state. Powell discusses modeling the motion of an optical fiber during the wetting and solidification of an adhesive solder droplet. In particular, Powell states that:

capillary forces of the liquid phase control the fiber position. ... [T]he presence of the liquid-solid-vapor triple line as well as a reduced liquid solder volume leads to a change in the net capillary force on the optical fiber.

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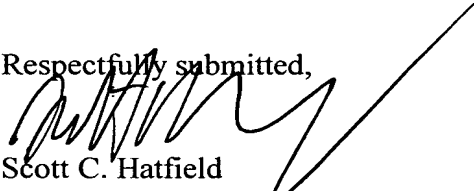
Powell, page 95. Nothing in Powell, however, teaches or suggests changing a fluid in contact with a solder droplet while the solder droplet is maintained in a liquid state.

Accordingly, neither Kaneyama or Powell teaches or suggests the recitations of Claim 14, and Claim 14 is thus patentable.

CONCLUSION

Accordingly, the Applicants submit that all pending claims in the present application are in condition for allowance, and a Notice of Allowance is respectfully requested in due course. The Examiner is encouraged to contact the undersigned attorney by telephone should any additional issues need to be addressed.

Respectfully submitted,



Scott C. Hatfield
Registration No. 38,476

Myers Bigel Sibley & Sajovec, P.A.
Post Office Box 37428
Raleigh, NC 27627
Telephone (919) 854-1400
Facsimile (919) 854-1401

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Joyce Paoli

